

Feuchtigkeitsmessgeräte  
Moisture Meter  
Humidimètre



DS7U Operating Manual



The DS7U can be used for measuring absolute moisture in veneer, cardboards, corrugated boards, cardboard pipes, ...

## Safety Tips:

- ☛ follow the operating instructions
- ☛ only use the meter as directed (see page 1)
- ☛ keep the meter away from live and current electrical parts
- ☛ avoid impacts
- ☛ protect the meter from heat
- ☛ keep the meter dry and try to prevent dirt from entering the case
- ☛ protect the meter from electrostatic discharge.
- ☛ the meter must be repaired or serviced only by qualified specialists



**Damages caused by failure to follow the above Safety Tips are not covered by the warranty !**

## Description:

The electronic moisture meter DS7U is used to determine in a matter of seconds the moisture in materials. The average moisture down to a depth of approx. 1 cm is measured.

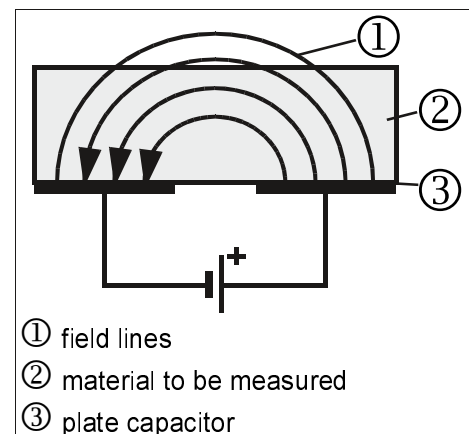
**Materials:** veneers, plywood boards, corrugated boards, card boards, cardboard pipes, ....

## Measuring Principle:

The meter works in accordance with the principle of an opened plate capacitor. The capacity of the capacitor depends on the material- (dielectric)-constant of the material in between the plates ②.

Compared with air ( $\epsilon_r = 1$ ), for example water has a very high dielectric-constant ( $\epsilon_r = 80$ ). The water content of a wet material can therefore be determined by determining the dielectric constant of this material.

The measuring electrodes ③ of the meter are contacting during the measuring process the materials to be measured ②, so that a high frequency electrical field ① is able to pass through the material. A micro processor receives the measured signals and determines from the measured value the percentage water content taking into account the material setting group.

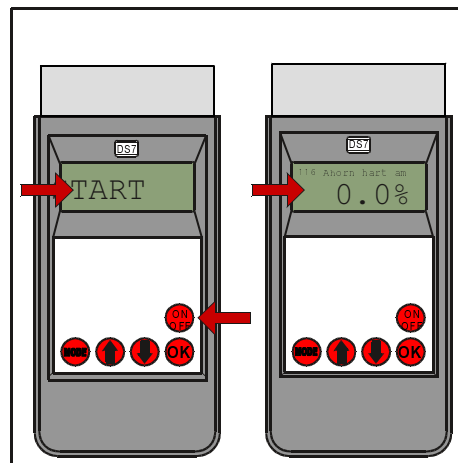


## Measurement Preparation:

- **material thickness < 3 cm** ③:  
use suitable basis ①  
e.g. polystyrene or foamed plastic plates – no metal!  
Or even better hole the material to be measured into the air
- **thin materials (< 1 cm)** ②:  
measure on a pile, thickness at least 2 cm, avoid air gaps between the individual layers
- **look for a smooth surface** |  
minimum size for the measurement: 4 x 10 cm
- **minimum distance of the electrodes from the edge of the surface: 1 cm**

## Turn on the Meter:

- Push ON/OFF-button, the display shows the adjusted material group. Hold the instrument into the air for automatic zero point measurement and correction. If the zero point is not in the valid range, the display shows "ZP-ERROR". As long as the ON/OFF button is pressed, date and time is displayed
- release the ON/OFF-button, the instrument is now ready for use with the setting before the last switching off.



## Main Menu

If the main menu is not shown after switching on, press „MODE“ for getting the main menu. Select the wished item with the arrow buttons and press „OK“

### Main Menue

- **material moisture:** the moisture measurement starts
- **storing:** settings for measurement storing
- **material:** material menus will be opened for selecting and changing the material settings
- **zero point:** the new zero point can be measured for later corrections
- **input value:** test measurements can be done, the input value can be correlated to moisture value in the material settings
- **settings:** the parameter settings can be changed
- **calibration:** the calibration measurements can be done, the test module PE50R is needed
- **device info:** serial no. and firmware no is shown

## Material Moisture

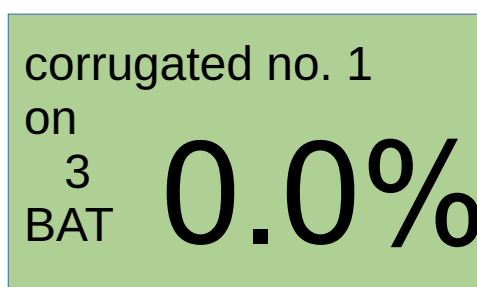
in the first line the selected material is shown  
in the second line the adjusted storage setting is shown  
In the third line the number of stored values is shown  
In the fourth line, at week battery alarm „BAT“ is shown  
In big characters the actual moisture content is shown

By pressing „MODE“ the main menu is shown

With the arrow buttons the wished material out of the selected group can be chosen. Eventually stored values will be deleted, as only measured values for one material setting can be stored.

## Material Moisture Measuring:

- hold the sensor free into the air for automatic zero point measurement
- stick the meter with its sensor into the material stack  
be sure that there are enough material around the sensor
- read of the moisture value



## Turn off the Meter:

- push "ON/OFF" button until the display shows an OFF-text as long as the ON/OFF-button is pressed
- release "ON/OFF" button, the meter is turned off

After an adjustable time the instrument switches off automatically. If switch off time is adjusted to 0, the automatic turning off is deactivated. In this case the instrument has to be turned off by pushing the ON/OFF-button

## Material menu

In the first line the actual selected material is shown. There are two different material menus, depending on the selected material group:

### Menu for fixed calibrations:

- **material selection:** first the material group, then the material in that group can be selected
- back back to the main menu

### Menu for customer specific calibrations

- **material selection:** first the material group, then the material in that group can be selected.
- **teaching material:** through sample measurements with known moisture content, a material calibration can be made, up to 100 teaching measurements are possible
- **change corner point:** calibration points can be changed.
- **change name:** The material text can be changed with the arrow buttons  
Press OK for the next character  
Press MODE for ending and storing
- **delete:** the material calibration data will be reset to standard values.  
the material can be taught .
- **back:** back to the main menu

corrugated no. 1  
- material selection  
back

corrugated no. 1  
- material selection  
teaching material  
change corner point  
change name  
delete  
back

## Material Teaching

For teaching you need to measure pieces with known moisture content. For each material more measurements can be done. From all stored measurements average values will be calculated and shown in the second line.

On the left the input values, on the right the moisture values  
In the third line, the measured comparing values are shown.

1. line: material name
2. line: average values from all taught values belonging to the selected material
3. line: In the first column the measurement no.  
If this number is > 1, then comparing values are already stored and further comparing values can be added.  
in the second column the measured value is shown  
in the third column the moisture value is shown

With the arrow buttons the moisture can be adjusted, by pressing the OK button the taught pair values are stored and a next teaching can be done. The teaching always can be ended by pressing the MODE button. Up to 99 teaching measurements are possible for each material.

<b>material 01</b>
<b>AVG:0456 - 08.5%</b>
<b>1:0436 - 08.8%</b>

<b>material 01</b>
<b>AVG:0456 - 08.6%</b>
<b>2:0476 - 09.3%</b>

## Change corner points

In the first line the actual selected material is shown.

There are in total 6 pair of values which are defining the material calibration. In the first column the edge no. is displayed, in the second column the input value and in the third column the moisture value.

Always the value marked with „<“ can be changed with the arrow buttons, by pressing „OK“ the next value can be changed.

By pressing „MODE“ the changing is aborted.

„1:“ is the starting edge, input 0 = moisture 0,0%, this cannot be changed.

„2:“ here the input value can be changed, this is the input value at the dry material, the moisture value should stay at 0,0%.

„3“ to „4“ the edge points can be changed.

„5“ the maximum moisture can be defined.

„6“ this corner is always input 5000 and the moisture of the „5“ point, this cannot be changed.

Material no.	1
1:	0 0,0%
2:	49< 0,0%
3:	271 5,5%
4:	717 14,5%
5:	3156 50,0%
6:	5000 50,0%

After confirming the 5th point values by pressing OK, the changing of the material calibration is finished, the main menu will be displayed.

After changing the calibration corner points, no additional teaching is possible for this material.

## Measurement Storage

The DS5U is able to store up to 500 moisture values.

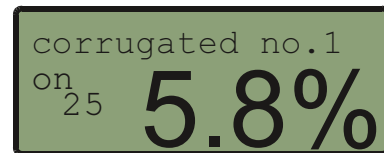
### Storage menu

- **setting:** the storage can be switched on, automatic or single measurements can be selected.
  - arrow down, „storing off“, „OK“: the storage is switched off, back to main menu
  - arrow up, „storing on“, OK: the storage is on
  - arrow up, „automatic“, OK: all measurement will be stored automatically till the storage is full. In the settings menu the number of measurements per second can be adjusted
  - arrow down, „single values“: moisture values will be stored by pressing „OK“ during the measurements
- **read values:** stored moisture values can be read
- **delete:** the stored values will be deleted

## Storage possibilities:

### storage on, single values:

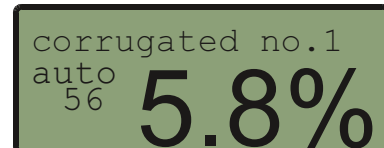
In the second line on the left side "on" is displayed, when the storage is aktiv. Single moisture values can be stored through pressing the OK-button. In the third line on the left, the number of stored values is displayed.



```
corrugated no.1
on
25 5.8%
```

### storage on, automatic

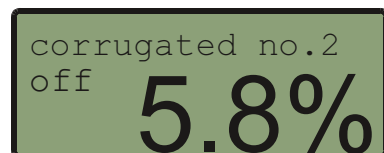
In the second line on the left side "auto" is displayed. All measurement values bigger then 0,0% will be stored automatically, the numbers of measuement per second can be adjusted. In the third line on the left, the number of stored values is displayed.



```
corrugated no.1
auto
56 5.8%
```

After changing the material setting, the storage is deleted automatically!

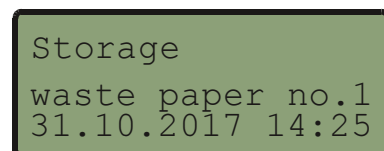
The automatic storing can be started stopped through pressing the OK-button. "OFF" is the displayed in the second line. Pressing again the OK-button the automatic storing is on again.



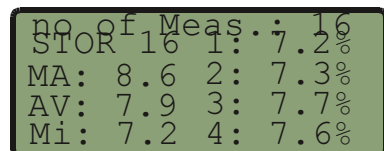
```
corrugated no.2
off
5.8%
```

## Read stored values

In the first window date and time at storage starting, used material, and number of stored values will be displayed. With pressing the OK-button, the second window appears with minimum, average and maximum of the stored value on the left side and all stored values on the right side. With the arrow buttons the display can be scrolled. With pressing the OK-button the storage window will be closed.



```
Storage
waste paper no.1
31.10.2017 14:25
```



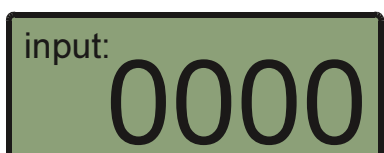
```
no of Meas.: 16
STOR 16 1: 7.2%
MA: 8.6 2: 7.3%
AV: 7.9 3: 7.7%
Mi: 7.2 4: 7.6%
```

With our Software DOSOFT and an USB-cable stored values can be transferred to a PC. The software can be downloaded from [www.doser.de](http://www.doser.de) and it can be used free for 30 days.

## Test Measurements / Calibration

### Input Measurement

The input measurement in combination with oven method measurements needs be done for getting customer specific calibration curves. For putting new calibrations into the instrument, code 50 can be used. Or alternatively with more comfort the software DOSOFT can be used.



```
input:
0000
```

## Checking Measuring Quality:

We recommend carrying out regular periodical controlling check measurements, as different local circumstances might need different material adjustments. (recommendation: controlling measurements by oven drying method.

## Oven Drying Method:

The oven drying method is the most accurate way to measure the material moisture in paper or wood. We recommend this for testing and calibrating of all electronic moisture meters.

Short description:

1. For measuring the weights we recommend a balance with an measuring range of 200g and an accuracy of 0,01g
2. For drying you need an oven with adjustable temperatures of 40, 100 and 104°C
3. Take a probe from wood with a sharp saw, avoid edge parts. For building materials take a probe with a sharp chisel to a depth of approx 3cm. the probe should be at least 20g
4. It is very important to take the weight of the first probe immediately, as air humidity may change the moisture content. Name of the first weight: wet weight (WW)
5. The probe must be dried in the oven until the weight is constant,  
the maximum drying temperatures for paper and cardboard : 100 °C (DIN ISO 287)  
the maximum drying temperatures for wood: 104 °C (ISO 3130-1975)  
the maximum drying temperatures for concrete: 50 °C  
the maximum drying temperatures for gipsum: 40 °C
7. The name of the dry weight is DW.
8. The moisture content is calculated with the formula:

$$\text{wood moistue (ISO 3130-1975):}$$
$$\text{MOISTURE} = \frac{(\text{WW} - \text{DW})}{\text{DW}} * 100 \%$$

$$\text{building materials, paper, cardboards:}$$
$$\text{MOISTURE} = \frac{(\text{WW} - \text{DW})}{\text{WW}} * 100 \%$$

## Basic Calibration:

The moisture meter can be tested and calibrated with the test module PE50R.

For this procedure the sensors need to be dry and clean!  
Select „Calibration“ in the main menu and put in code no 97

1. Zero Point  
the zero point only can be measured and not adjusted. The zero point should be between 10 and 190. If the measured value is above 200, no zero point will be measured. Hold the meter with its sensors free into the air, both values must be equal, wait till the zero point is stable and press the OK-button.  
If the zero point is out of range, the meter needs to be repaired!
2. Measurement with Test Modul PE50R:  
the meter needs to be stucked into the test module PE50R.  
The calibration result is shown, additional the calibration factor. This factor can be changed with the arrow buttons till the measurement result is as exact as possible **200**. The factor can be changed between 150 and 255. With pressing the OK-button, the changed calibration will be stored and the calibration procedure finished.  
If the calibration is not possible, the meter needs to be repaired.

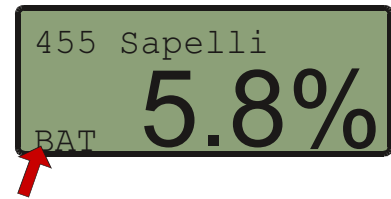
calibrating:  
measuring val : 123  
Zero point: 123<

calibrating:  
PE50R: 191  
factor: 223<

## Battery:

we recommend to always use high quality batteries, e.g. alkaline or lithium 9V block batteries.

If the battery is running low, the display shows "BAT" in the bottom line.



## Change battery:

- open the battery box for example with a small screw driver
- take out the battery
- **insert new battery, observing the correct polarity**

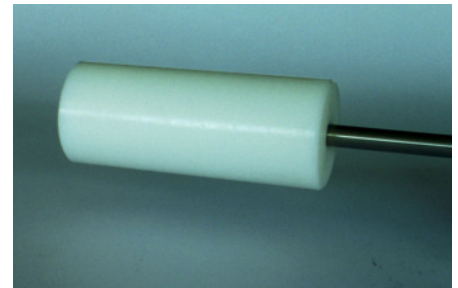
## Attention!

In accordance with battery legislation, all used batteries must be disposed off in special battery collecting bins.

The disposal of old or used batteries as part of normal waste is not allowed!

## Optional Extras:

- manufacturer certificate
- test module PE50R for checking and calibrating the moisture meter, also possible with manufacturer certificate
- customer specific calibration of the moisture meter
- PC software DOSOFT, can be downloaded from [www.doser.de](http://www.doser.de) and tested for 30 days for free
- alkaline battery 9V block



Our operating instructions are intended for guidance and to provide information on our products and their uses. They should not be taken to imply special characteristics or suitability for any specific purpose, other than those stated.

We constantly work to improve our products and reserve the right to alter our products and operating instructions without advanced notification.

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## Materials, selectable with material menu → material selection

### Building Materials

Ytong  
pumice  
plaserPutz  
wall tiles  
brick  
Eternit panels  
floor tiles  
anhyd. screed  
concrete  
marble  
lime stone

### Holz

no. 1: Balsa  
no. 2: Abachi  
no. 3: Fii, Gabun, Hemlock, Ilomba, Lauan, Meranti light, Oregon-Pine, Poplar, Red-Pine  
no. 4: Carolinapine, Cedro, Pine, Limba, Linde, Horse -Chestnut, Silver-Willow, Ceder  
no. 5: Ash, Birch, Beech, Cherry, Elm, Maple, Nut, Pitch-Pine, Red-Oak, Ramin, Sipo, Teak  
no. 6: Apple, chipboard, Meranti dark, Merbau, Oak, Pear, Padouk, White-Pine, Zebrano  
no. 7: Jarrach, Keruing, Macore, Mahagony, Red-Balau, Wenge  
no. 8: Bongossy, Cocobolo, Ebony  
no. 9: Snakewood

### Paper, cardboard

P 1: filter paper, wrapping tissue  
P 2: crepe paper, semi chemical fluting medium, testliner, "schrenz"  
P 3: recycled fluting medium, wrapping paper  
P 4: kraft paper  
P 5: offset paper

### Corrugated boards (code 34):

single boards on Styropor,  
Touch line accross to the wave  
CB 1: light corrugated board  
CB 2: 2,9 x 6,0  
CB 3: double 2,9x6,0 + 1,4x4,0  
CB 4: double 1,4x4,0 + 2,9x6,0  
CB 5: 4,0 x 7,5  
CB 6: D2,0 x 6,0

### Furniere

116, Maple hard am  
133, Aniegre  
150, Birch europ.  
190, Bubinga  
200, Beech europ.  
259, Doussie  
261, Iroko  
270, Oak white am  
271, Oak europ.  
274, Oak red am  
290, Alder europ.  
301, Ash europ.  
305, Ash burl eu  
362, Pine europ.  
380, cherry europ  
381, cherry bl am  
390, Larch europ.  
455, Sapeli  
550, Walnut am  
551, Walnut eu  
552, Walnut burl eu  
660, Satinwood  
700, Teak  
764, Wenge  
770, Zebrano  
931, Spruce europ.  
935, Pear w. wild eu  
936, Poplar burl.eu.  
937, Sycomore europ.  
944, Yew europ.

### cardboard pipe

PH 1: 3 mm thick  
PH 2: 5 mm thick  
PH 3: 7 mm thick  
PH 4: 10 mm thick  
PH 5: 12 mm thick  
PH 6: 15 mm thick  
PH 7: 20 mm thick